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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,183	01/03/2007	Eiji Sunahara	65792(46342)	1851

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EXAMINER	
HOLLERAN, ANNE L	

ART UNIT	PAPER NUMBER
1643	

MAIL DATE	DELIVERY MODE
07/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,183	SUNAHARA ET AL.	
	Examiner	Art Unit	
	ANNE L. HOLLERAN	1643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) *15-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/07; 2/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-14, and species election (a), antibody that binds to SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 7 or SEQ ID NO: 10, in the reply filed on 4/21/2009 is acknowledged. The traversal is on the ground(s) that consideration and examination of the group s specified in the restriction should not impose an undue burden; and that significant expense and time would be saved if all of the groups were search and examined at this time. This is not found persuasive because in the previous Office action it was established that the invention groups lacked unity of invention and did not share a special technical feature. Thus, a search for the products of group I would not be coextensive with a search for any of the other groups set forth in the previous Office action. Therefore, an additional and undue search burden would be placed on the examiner to have to search and examine all of the invention groups together at this time.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-24 are pending.

Claims 15-24, drawn to non-elected inventions, are withdrawn from consideration.

Claims 1-14 are examined on the merits.

Objections

The sequence listing is objected to because the specification (page 86) discloses that SEQ ID NO: 1 is the sequence of SEMA4B, which is a protein encoded by the SEMA4B gene of

GenBank Accession No. XM-044533; NM_198925 gene, or NM_020210 gene. However, an alignment with an amino acid sequence that is encoded by NM_020210 (NP_064595.2, GI: 39777608) with SEQ ID NO: 1 is not 100% identical. Additionally, the record of copending application 10/540,394 indicates that there is an error in the amino acid sequence for SEQ ID NO: 1. Therefore, it is not clear if the sequence listing contains the correct amino acid sequence for SEQ ID NO: 1 (or SEQ ID NOS: 4, 7 and 10). See example alignment below with amino acid sequence of SEQ ID NO: 1 and amino acid sequence of semaphoring 4B precursor.

```
semaphorin 4B precursor [Homo sapiens]
 ref|NP_945119.1|  semaphorin 4B precursor [Homo sapiens]
 dbj|BAG11357.1|  semaphorin-4B precursor [synthetic construct]
Length=837

 GENE ID: 10509 SEMA4B | sema domain, immunoglobulin domain (Ig),
transmembrane
domain (TM) and short cytoplasmic domain, (semaphorin) 4B [Homo sapiens]
(Over 10 PubMed links)

 Score = 1698 bits (4398),  Expect = 0.0, Method: Compositional matrix
adjust.
 Identities = 831/837 (99%), Positives = 831/837 (99%), Gaps = 0/837 (0%)

Query  1    MLRTAMGLRSWLAAPWGALPPRPPLLLLLLLLLLQPPPPTWALSPRISLPLGSEERPFL  60
            MLRTAMGLRSWLAAPWGALPPRPPLLLLLLLLLLQPPPPTWALSPRISLPLGSEERPFL
Sbjct  1    MLRTAMGLRSWLAAPWGALPPRPPLLLLLLLLLLQPPPPTWALSPRISLPLGSEERPFL  60

Query  61   RFEAEHISNYTALLLSRDGRTLYVGAREALFALSSNLSFLPGGEYQELLWGADAEKKQQC  120
            RFEAEHISNYTALLLSRDGRTLYVGAREALFALSSNLSFLPGGEYQELLWGADAEKKQQC
Sbjct  61   RFEAEHISNYTALLLSRDGRTLYVGAREALFALSSNLSFLPGGEYQELLWGADAEKKQQC  120

Query  121  SFKGKDPQRDCQNYIKILLPLSGSHLFTCGTAAFSPMCTYINMENFTLARDEKGNVLLED  180
            SFKGKDPQRDCQNYIKILLPLSGSHLFTCGTAAFSPMCTYINMENFTLARDEKGNVLLED
Sbjct  121  SFKGKDPQRDCQNYIKILLPLSGSHLFTCGTAAFSPMCTYINMENFTLARDEKGNVLLED  180

Query  181  GKGRCPFDPNFKSTALVVDGELYTGTVSSFQGNDPAISRSQSLRPTKTESSLNWLQDPAF  240
            GKGRCPFDPNFKSTALVVDGELYTGTVSSFQGNDPAISRSQSLRPTKTESSLNWLQDPAF
Sbjct  181  GKGRCPFDPNFKSTALVVDGELYTGTVSSFQGNDPAISRSQSLRPTKTESSLNWLQDPAF  240

Query  241  VASAYIPESLGSLQGDDDKIYFFFSETGQEFEFFENTIVSRIARICKGDEGGERVLQQRW  300
            VASAYIPESLGSLQGDDDKIYFFFSETGQEFEFFENTIVSRIARICKGDEGGERVLQQRW
Sbjct  241  VASAYIPESLGSLQGDDDKIYFFFSETGQEFEFFENTIVSRIARICKGDEGGERVLQQRW  300

Query  301  TSFLKAQLLCSRPDDGFPFNVLQDVFTLSPSPQDWRDTLFYGVFTSQWHRGTTEGSAVCV  360
            TSFLKAQLLCSRPDDGFPFNVLQDVFTLSPSPQDWRDTLFYGVFTSQWHRGTTEGSAVCV
Sbjct  301  TSFLKAQLLCSRPDDGFPFNVLQDVFTLSPSPQDWRDTLFYGVFTSQWHRGTTEGSAVCV  360
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Query  361  FTMKDVQRVFSGLYKEVNRETQQMVHRDPPVPTPRPGACITNSARERKINSSLQLPDRVL  420
            FTMKDVQRVFSGLYKEVNRETQQ       PVPTPRPGACITNSARERKINSSLQLPDRVL
Sbjct  361  FTMKDVQRVFSGLYKEVNRETQQWYTVTHPVPTPRPGACITNSARERKINSSLQLPDRVL  420

Query  421  NFLKDHFLMDGQVRSRMLLLQPQARYQRVAVHRVPGLHHTYDVLFLGTGDGRLHKAVSVG  480
            NFLKDHFLMDGQVRSRMLLLQPQARYQRVAVHRVPGLHHTYDVLFLGTGDGRLHKAVSVG
Sbjct  421  NFLKDHFLMDGQVRSRMLLLQPQARYQRVAVHRVPGLHHTYDVLFLGTGDGRLHKAVSVG  480

Query  481  PRVHIIEELQIFSSGQPVQNLLLDTHRGLLYAASHSGVVQVPMANCSLYRSCGDCLLARD  540
            PRVHIIEELQIFSSGQPVQNLLLDTHRGLLYAASHSGVVQVPMANCSLYRSCGDCLLARD
Sbjct  481  PRVHIIEELQIFSSGQPVQNLLLDTHRGLLYAASHSGVVQVPMANCSLYRSCGDCLLARD  540

Query  541  PYCAWSGSSCKHVSLYQPQLATRPWIQDIEGASAKDLCSASSVVSPSFVPTGEKPCEQVQ  600
            PYCAWSGSSCKHVSLYQPQLATRPWIQDIEGASAKDLCSASSVVSPSFVPTGEKPCEQVQ
Sbjct  541  PYCAWSGSSCKHVSLYQPQLATRPWIQDIEGASAKDLCSASSVVSPSFVPTGEKPCEQVQ  600

Query  601  FQPNTVNTLACPLLSNLATRLWLRNGAPVNASASCHVLPTGDLLLVGTQQLGEFQCWSLE  660
            FQPNTVNTLACPLLSNLATRLWLRNGAPVNASASCHVLPTGDLLLVGTQQLGEFQCWSLE
Sbjct  601  FQPNTVNTLACPLLSNLATRLWLRNGAPVNASASCHVLPTGDLLLVGTQQLGEFQCWSLE  660

Query  661  EGFQQLVASYCPEVVEDGVADQTDEGGSVPVIISTSRVSAPAGGKASWGADRSYWKEFLV  720
            EGFQQLVASYCPEVVEDGVADQTDEGGSVPVIISTSRVSAPAGGKASWGADRSYWKEFLV
Sbjct  661  EGFQQLVASYCPEVVEDGVADQTDEGGSVPVIISTSRVSAPAGGKASWGADRSYWKEFLV  720

Query  721  MCTLFVLAVLLPVLFLLYRHRNSMKVFLKQGECASVHPKTCPVVLPPETRPLNGLGPPST  780
            MCTLFVLAVLLPVLFLLYRHRNSMKVFLKQGECASVHPKTCPVVLPPETRPLNGLGPPST
Sbjct  721  MCTLFVLAVLLPVLFLLYRHRNSMKVFLKQGECASVHPKTCPVVLPPETRPLNGLGPPST  780

Query  781  PLDHRGYQSLSDSPPGSRVFTESEKRPLSIQDSFVEVSPVCPRPRVRLGSEIRDSVV  837
            PLDHRGYQSLSDSPPGSRVFTESEKRPLSIQDSFVEVSPVCPRPRVRLGSEIRDSVV
Sbjct  781  PLDHRGYQSLSDSPPGSRVFTESEKRPLSIQDSFVEVSPVCPRPRVRLGSEIRDSVV  837
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Claim Rejections - 35 USC § 101

Claims 1-3 and 5-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1-3 and 5-14 are drawn to substances or agents that encompass products that are natural phenomena, such a polyclonal antisera that has not been isolated or purified, and where the hand of man is not evident. This rejection would be obviated by the addition of the word "isolated" to characterize the substances or agents of the claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-3, and 8-11 are indefinite because of the phrase "substantially the same amino acid sequence as the amino acid sequence represented by". The specification does not have a definition for what is meant by the phrase. Therefore, it is not clear what is the boundary. For example, is a sequence having 30% sequence identity within the scope of "substantially the same amino acid sequence represented by"?

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

This is a written description rejection for the genus of antibodies that bind to the antigens comprising the amino acid sequence of SEQ ID NO: 1, 4, 7 or 10, its partial peptide or salt thereof, where the antibodies also have the property of having the activity of neutralizing cancer cell growth stimulation induced by the binding of a protein comprising the same or substantially the same amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10, its partial peptide or salt thereof, to a protein comprising the same or substantially the same amino acid sequence represented by SEQ ID NO: 26, its partial peptide or a salt thereof, where the antibodies also have the property of inhibiting the activity of a protein comprising the same or substantially the same amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10, its partial peptide or salt thereof, where the antibodies also have the property of inhibiting the activity of a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 26, its partial peptide or a salt thereof, or where the antibodies also have the property of inhibiting phosphorylation of a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 26, its partial peptide.

The specification provides 4 affinity purified polyclonal antibody preparations AS-2531, AS-2532, AS-2591 and AS-2592, which were made by immunizing rabbits with peptides of 12-15 amino acids in length from SEQ ID NO: 1 (SEQ ID NOS: 22-25) coupled to keyhole limpet hemocyanin (pages 91-92). Antibodies AS-2532, AS-2591 and AS-2592 recognized SEMA4B (SEQ ID NO: 1) at a position near 100 kD molecular weight (pages 92-93). Each of antibodies AS-2531, AS-2532, AS-2591 and AS-2592 were able to immunoprecipitate SEMA4B protein (recognized non-denatured SEMA4B; see page 94). Antibodies AS-2531 and AS-2532 were

able to induce apoptosis in non-small lung cancer cell line NCI-H2228 (page 100-101). Antibodies 1, 2 and 4 were able to inhibit the binding of SEMA4B to plexin B1 by 63%, 74% and 60%, respectively (see page 108-109), and were able to inhibit the in vitro growth of NCI-H358 cell line (see page 109-111).

The breadth of the claims encompasses antibodies that bind to a very broad genus of antigens because the antigens are those that comprise a protein comprising the same or *substantially the same* amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10, or comprise *its partial peptide*. In contrast, the specification provides antibodies that are relatively mono-specific because each is made to a peptide of 12-15 amino acids taken from SEQ ID NO: 1, and binds to SEQ ID NO: 1. The specification fails to demonstrate whether these antibodies bind to SEQ ID NOS: 4, 7, or 10, and the specification fails to demonstrate whether these antibodies bind to any other proteins that would be encompassed by the phrase "comprising [...] substantially the same amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10, [or] its partial peptide". Therefore, with respect to the antigen which is bound by an antibody encompassed by the claimed inventions, the description provided by the specification is not representative of the broad scope, because, absent evidence to the contrary the antibodies are limited to those that bind to SEQ ID NO: 1.

The claims recite functional properties of the claimed antibodies such as "having the activity of neutralizing cancer cell growth stimulation induced by the binding of a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 7 or SEQ ID NO: 10, its partial peptide or a salt thereof", inhibiting growth of cancer cells, inhibiting the activity of a protein

comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 26, or inhibiting phosphorylation of a protein comprising the same or substantially the same amino acid sequence represented by SEQ ID NO: 26. The antibodies provided by the disclosure of the specification bind to SEQ ID NO: 1, and inhibit the growth of NCI-H358 cancer cells in vitro, and inhibit the binding of SEQ ID NO: 1 to SEQ ID NO: 26. However, the specification fails to establish that any of the exemplified antibodies inhibits phosphorylation of SEQ ID NO: 26, and fails to establish that proteins comprising SEQ ID NO: 4, 7, or 10 bind to SEQ ID NO: 26 and that the disclosed antibodies prevent the binding of SEQ ID NO: 4, 7, or 10 to SEQ ID NO: 26. Further, the specification fails to establish that the antibodies provided by the disclosure of the specification bind to a protein that is substantially the same in its amino acid sequence to that of SEQ ID NO: 1, 4, 7 or 10, and that binding to such a protein would result in any of the recited activities. The specification fails to establish that any of the exemplified antibodies would bind to a protein that comprises a fragment of any of SEQ ID NOS: 1, 4, 7 and 10 and that binding to such a protein would result in any of the recited functions. What is missing from the specification is data showing that any of SEQ ID NOS: 4, 7 and 10 binds to SEQ ID NO: 26, that the exemplified antibodies inhibit phosphorylation of SEQ ID NO: 26, and that any proteins having "substantially the same" amino acid sequence bind to SEQ ID NO: 26. Without such information, the specification lacks a disclosure of species that are representative of the claims, because the claims encompass antibodies that bind to antigens that are significantly different in structure from the structure of SEQ ID NO: 1.

While the specification has established that SEQ ID NO: 1 binds to SEQ ID NO: 26, and that the exemplified antibodies inhibit this binding, and inhibit in vitro cell growth of a particular

cell line, the specification has not established this for any of the other peptides, and has not established this for the broad genus of polypeptides that comprise substantially the same amino acid sequence as SEQ ID NO: 1, 4, 7 or 10, or comprise its partial peptide. Furthermore, even one could argue that the exemplified antibodies bind to SEQ ID NO: 4, 7, or 10, there is no disclosure that SEQ ID NO: 4, 7, or 10 bind to SEQ ID NO: 26, or that polypeptides having substantially the same sequence, comprising a partial peptide bind to SEQ ID NO: 26 bind to SEQ ID NO: 26. There is no disclosure of a correlation between any structural attribute of SEQ ID NO: 1 with the function of binding to SEQ ID NO: 26 so than one of skill in the art would be permitted to envision structural variants of SEQ ID NO: 1, 4, 7 or 10 that would likely bind to SEQ ID NO: 26. Thus, the specification fails to provide the requisite disclosure of a genus of antigens that would correspond in scope to the genus of claimed antibodies. Therefore, the specification fails to provide an adequate written description for the genus of claimed antibodies.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Herold (Herold, C., et al., Int. Immunology 7: 1-8, 1994).

The claimed inventions encompass antibodies that bind to CD100 (Semaphorin 4D) because the claims are drawn to a substance that is an antibody to a protein comprising the same

or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10, its partial peptide, or a salt thereof. Because the protein to which the antibody binds may comprise "substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10" or may comprise "its partial peptide", the protein to which the antibody may be bind includes such proteins as CD100. Below is an alignment between SEQ ID NO: 1 of the instant application and CD100, showing that SEQ ID NO: 1 has substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, for example, and showing that CD100 comprises a partial peptide of SEQ ID NO: 1, for example.

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GENE ID: 10507 SEMA4D | sema domain, immunoglobulin domain (Ig),
transmembrane
domain (TM) and short cytoplasmic domain, (semaphorin) 4D [Homo sapiens]
(Over 10 PubMed links)

 Score =  468 bits (1203),  Expect = 8e-131, Method: Compositional matrix
adjust.
 Identities = 273/652 (41%), Positives = 382/652 (58%), Gaps = 44/652 (6%)

Query  24   PLLLLLLLLLLLQPPPPTWALSPRISLPLGSEERPFLRFEAEHISNYTALLLSRDGRTLY  83
            P+  LL+ L ++       +A  PRI+      E   ++F     I NY+ALLLS D  TLY
Sbjct  6    PIRGLLMALAVMFGTAMAFAPIPRITWE--HREVHLVQFHEPDIYNYSALLLSEDKDTLY  63

Query  84   VGAREALFALSS-NLSFLPGGEYQELLWGADAEKKQQCSFKGKDPQRDCQNYIKILLPLS  142
            +GAREA+FA+++ N+S      +  E+ W     +KK +C+ KGK  Q +C NYI++L PLS
Sbjct  64   IGAREAVFAVNALNIS----EKQHEVYWKVSEDKKAKCAEKGKSKQTECLNYIRVLQPLS  119

Query  143  GSHLFTCGTAAFSPMCTYINMENFTLARDEKGNVLLEDGKGRCPFDPNFKSTALVVDGEL  202
             + L+ CGT AF P C ++N+ +F             EDGKGRCPFDP     T+++VDGEL
Sbjct  120  ATSLYVCGTNAFQPACDHLNLTSFKFLGKN------EDGKGRCPFDPAHSYTSVMVDGEL  173

Query  203  YTGTVSSFQGNDPAISRSQSLRPTKTESSLNWLQDPAFVASAYIPESLGSLQGDDDKIYF  262
            Y+GT  +F G++P ISR+ S  P +TE ++ WL +P+FV +  I +S  S  G+DD++YF
Sbjct  174  YSGTSYNFLGSEPIISRNSSHSPLRTEYAIPWLNEPSFVFADVIRKSPDSPDGEDDRVYF  233

Query  263  FFSETGQEFEFFENTIVSRIARICKGDEGGERVLQQRWTSFLKAQLLCSRPDDGFPFNVL  322
            FF+E   E+EF    ++ RIAR+CKGD+GG R LQ++WTSFLKA+L+CSRPD G  FNVL
Sbjct  234  FFTEVSVEYEFVFRVLIPRIARVCKGDQGGLRTLQKKWTSFLKARLICSRPDSGLVFNVL  293

Query  323  QDVFTL-SPSPQDWRDTLFYGVFTSQWHRGTTEGSAVCVFTMKDVQRVFS-GLYKE---V  377
            +DVF L SP     +  +FY +FT Q +       SAVC + +    + VFS G Y +   V
Sbjct  294  RDVFVLRSPG---LKVPVFYALFTPQLN--NVGLSAVCAYNLSTAEEVFSHGKYMQSTTV  348
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Query  378  NRETQQMVHRDPPVPTPRPGACITNSARERKINSSLQLPDRVLNFLKDHFLMDGQVR---  434
             +   + V  + PVP PRPGACI + AR      SSL LPD+ L F+KDH LMD  V
Sbjct  349  EQSHTKWVRYNGPVPKPRPGACIDSEARAANYTSSLNLPDKTLQFVKDHPLMDDSVTPID  408

Query  435  SRMLLLQPQARYQRVAVHRVPGLHHT-YDVLFLGTGDGRLHKAVSVGPRVHIIEELQIFS  493
            +R  L++      Y ++ V R    L  T YDV+F+ T  G LHKA+S+   VHIIEE Q+F
Sbjct  409  NRPRLIKKDVNYTQIVVDRTQALDGTVYDVMFVSTDRGALHKAISLEHAVHIIEETQLFQ  468

Query  494  SGQPVQNLLLDTHRG--LLYAASHSGVVQVPMANCSLYRSCGDCLLARDPYCAWSGSSCK  551
              +PVQ LLL + +G   +YA S+SGVVQ P+A C  + +C DC+LARDPYCAWS  +
Sbjct  469  DFEPVQTLLLSSKKGNRFVYAGSNSGVVQAPLAFCGKHGTCEDCVLARDPYCAWSPPTAT  528

Query  552  HVSLYQPQLATRPWIQDIEGASAKDLCSASSVVSPSFVPTGEKPCEQVQFQPNTVNTLAC  611
             V+L+Q +  +R  IQ++ G ++  +C   S  S            Q  F+      L C
Sbjct  529  CVALHQTESPSRGLIQEMSGDAS--VCPDKSKGS----------YRQHFFKHGGTAELKC  576

Query  612  PLLSNLATRLW-LRNGAPVNASASCHVLPTGDLLLVGTQQ--LGEFQCWSLE  660
               SNLA   W  +NG     S    ++   +LL+   +   G +QC S E
Sbjct  577  SQKSNLARVFWKFQNGVLKAESPKYGLMGRKNLLIFNLSEGDSGVYQCLSEE  628
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Herold teaches antibodies that bind to CD100. The antibodies are monoclonal antibodies BB18 and BD16 (see abstract). Monoclonal antibody BD16 inhibits CD3 induced PBL proliferation, and causes partial down modulation of CD100 (page 4, right column; page 6, left column). Monoclonal antibody BB18 causes rapid down modulation of CD100 (page 4, right column; page 6, left column). Therefore, the monoclonal antibodies of Herold are antibodies that would inhibit the binding of a protein comprising substantially the same amino acid sequence as that of SEQ ID NO: 1 or comprising its partial peptide from binding to a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 26, because once down modulation has occurred CD100 is no longer available to bind to the protein comprising the amino acid of SEQ ID NO: 26.

Claim 3 recites an antibody having the activity of neutralizing cancer cell growth stimulation induced by the binding of a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7, or 10, its

partial peptide, or a salt thereof, to a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 26. Because the monoclonal antibodies of Herold cause rapid down modulation, or at least partial down modulation of CD100, the antibodies of Herold would inhibit the binding between SEQ ID NO: 26 and the protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7, or 10, its partial peptide, or a salt thereof, and thereby have the activity of neutralizing cancer cell growth stimulation induced by the binding between SEQ ID NO: 26 and the protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7, or 10, its partial peptide, or a salt thereof. Claims 5-7 are drawn to agents that comprise a substance according to claim 1, where intended uses are recited. As discussed above, Herold teaches a substance that is the same as that of claim 1. Therefore, Herold teaches the agents of claims 5-7.

Claim 8 is drawn to an agent for inhibiting the growth of cancer cells, which comprises a substance that inhibits the activity of a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10, its partial peptide or a salt thereof. Because the antibodies of Herold cause rapid down modulation, or at least partial down modulation of CD100, the antibodies of Herold are examples of substances that inhibit the activity of a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7, or 10, its partial peptide, or a salt thereof.

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Herold (Herold, C., et al., Int. Immunology 7: 1-8, 1994) as evidenced by Giordano (Giordano, S., et al. Nature Cell Biology, 4: 720-724, 2002; cited in the IDS).

The claims encompass substances such as that of claim 9, which is drawn to a substance that inhibits the activity of a protein comprising the same or substantially the same amino acid sequences as the amino acid sequence represented by SEQ ID NO: 26, its partial peptide or salt thereof. The amino acid sequence of SEQ ID NO: 26 is the amino acid sequence of Plexin-B1. Giordano provides evidence that CD100 (semaphorin 4D) binds to Plexin-B1. As discussed above, CD100 is a protein that is within the scope of a protein that comprises "substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7 or 10", or comprises "its partial peptide". Giordano also provides evidence that CD100 (semaphoring 4D) stimulates invasive growth in epithelial cells expressing Plexin B1 (see figure 1). Further Giordano teaches that CD100 (semaphorin 4D) causes tyrosine phosphorylation of Plexin B1 (see page 721, right column).

Herold teaches antibodies that cause rapid down modulation, or partial down modulation of CD100. Thus, the antibodies of Herold would be substances that inhibit the activity of Plexin B1 (SEQ ID NO: 26) as recited in claim 9, inhibit the phosphorylation of Plexin B1 as recited in claim 10, or neutralize cancer growth stimulation induced by the binding of a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, 4, 7, or 10, its partial peptide, or a salt thereof, to a protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 26 as recited in claim 3 or 11, because once down modulation of CD100 occurred it

would no longer be available to bind to Plexin B1. Claims 5-7 or claims 12-14 are drawn to agents that comprise a substance according to claim 1 or claim 9, where intended uses are recited. As discussed above, Herold teaches a substance that is the same as that of claim 1 or claim 9. Therefore, Herold teaches the agents of claims 5-7 or claims 12-14.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 15, 25, 26, 29, 30, 43-48, 52-54, and 58-63 of copending Application No. 10/540,394. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 15, 25, 26, 29, 30, 43-48, 52-54, and 58-63 of copending application no. 10/540,394 are drawn to pharmaceutical compositions

comprising an antibody that bind to SEQ ID NO: 1 and is characterized as an apoptosis promoter.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne Holleran, whose telephone number is (571) 272-0833. The examiner can normally be reached on Monday through Friday from 9:30 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Helms, can be reached on (571) 272-0832. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Papers related to this application may be submitted to Group 1600 by facsimile transmission. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Official Fax number for Group 1600 is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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July 2, 2009
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